

Tau-neutrino Cross Section Paper

Proposed Outline

0. Abstract

1. Introduction

[brief review of experimental setup; review of emulsion target and scanning; brief outline of tau analysis; outline of this paper]

2. Data Collection and Reduction

2.1 Triggering and running

2.2 Filtering, stripping, scanning

2.3 Final (all) neutrino event sample

3. Overview of Data Analysis

3.0 Event reconstruction

3.0.1 Spatial Resolution (Drift chambers, Sci Fi)

3.0.2 Track fitting, momentum, resolution

3.0.3 EM shower reconstruction, resolution

3.0.4 Neutrino Vertex Reconstruction, Spatial Resolution

3.1. Emulsion track fitting / location

3.1.0 Event location

3.1.1 Momentum from Coulomb Scattering

3.1.2 Electron/gamma identification in emulsion

3.2. Secondary vertex analyses

3.2.1 Decay Search

3.3. Lepton tagging

3.4. ν_τ / charm Recognition Analysis

3.4.1. Simple Topology / Kinematics

3.4.2. Multivariate analysis

3.4.3. ANN

4. Survey of Data (**I propose: numu and nue Analysis**)

4.1. Expected Composition

4.1.1 Muon and electron neutrino identification (scanning, ANN)

4.2. ν_μ CC events

4.2.1. Prompt and non-prompt

4.2.2. μ^+ and μ^- ratio and spectra vs Monte Carlo

4.3. ν_e CC events

4.3.1. Estimated e energy

4.3.2 nue spectrum vs MC

5. ν_τ Signal

5.0 Data Reduction table

5.1. List of event candidates (or table)

5.2. Multi-variate analysis and table

5.3 Comparison to charm events

6. Systematic Uncertainties

6.1. POT

6.2. ν Production in dump

6.3. Electronic efficiencies

6.3.1. Trigger, live-times, events-on-tape

6.4. Analysis efficiencies

6.4.1. Stripping / Scanning

6.4.2. Location

6.4.3. Decay search

6.5. Background estimates to ν_τ signal

6.6. ν_{μ} , ν_e , ν_{τ} absolute and relative detection efficiencies

7. ν_τ Cross Section

7.0 Correction for threshold effects

7.1. Relative

7.2. Absolute

8. Conclusions and restate main results